What is claimed is:

1.

A substantially pure adduct of an estrogen and a purine selected from the group consisting of guanine or adenine.

2.

An adduct according to claim 1 wherein the estrogen is estrone.

3.

An adduct according to claim 1 wherein the estrogen is 17β-estradiol.

4.

An adduct according to claim 1 wherein the adduct is selected from the group consisting of 7[4-hydroxyestron-1(α,β)-yl]guanine, 7[4-hydroxyestradiol-1(α,β)-yl]guanine, N^2[2-hydroxyestron-6-yl]deoxyguanosine, N^2[2-hydroxyestradiol-6-yl]deoxyguanosine, N^6[2-hydroxyestron-6-yl]deoxyadenosine, and N^6[2-hydroxyestradiol-6-yl]deoxyadenosine.

5.

An adduct according to claim 1 wherein the adduct is 7[4-hydroxyestron-1(α,β)-yl]guanine.

6.

An adduct according to claim 1 wherein the adduct is 7[4-hydroxyestradiol-1(α,β)-yl]guanine.

7.

A substantially pure adduct of estrone-3,4-quinone and guanine.

8.

A substantially pure adduct of estrone-2,3-quinone and a purine nucleoside selected from the

30.

A method according to claim 29 wherein the fluorescent probe is dansyl chloride.

31.

A method according to claim 29 wherein the reaction step takes place in acetone under basic conditions.

32.

A method of concentrating and purifying estrogen-nucleoside and estrogen-mercapturate adducts isolated from biological sources comprising:

covalently coupling anti-adduct antibodies to a solid matrix to form bound anti-adduct antibodies, wherein the matrix is derivatized with couplers selected from the group consisting of CNBr, N-hydroxysuccinimide, and hydrazide; and

detecting the bound anti-adduct antibodies with polyclonal antibodies wherein the polyclonal antibodies are specific for the anti-adduct antibodies.

2 ~~33.~~ 1

A method according to claim ~~32~~ wherein the solid matrix is agarose gel.

3 ~~34.~~ 2

A method according to claim ~~33~~ wherein the agarose gel is in the form of beads and further providing that the beads are from about 50-200 μ in diameter.

4 ~~35.~~ 1

A method according to claim ~~32~~ wherein the biological source is selected from the group consisting of human serum, tissues, tissue extracts, urine and other bodily fluids.

group consisting of deoxyguanosine or deoxyadenosine.

9.

A substantially pure adduct of a compound selected from the group consisting of N-acetyl cysteine, cysteine and;
an estrogen.

10.

A substantially pure adduct according to claim 9 wherein the estrogen is selected from the group consisting of estrone and 17β-estradiol.

11.

A substantially pure adduct according to claim 9 wherein the adduct is selected from the group consisting of 4-hydroxyestron-1-yl-cysteine, 4-hydroxyestradiol-1-yl-cysteine, 4-hydroxyestron-1-yl-N-acetylcysteine, 4-hydroxyestradiol-1-yl-N-acetylcysteine, 2-hydroxyestron-1-yl-cysteine, 2-hydroxyestradiol-1-yl-cysteine, 2-hydroxyestron-1-yl-N-acetylcysteine, 2-hydroxyestradiol-1-yl-N-acetylcysteine, 2-hydroxyestron-4-yl-cysteine, 2-hydroxyestradiol-4-yl-cysteine, 2-hydroxyestron-4-yl-N-acetylcysteine, and 2-hydroxyestradiol-4-yl-N-acetylcysteine.

12.

A diagnostic method for detecting the presence of adducts selected from the group consisting of estrogen-guanine adducts and estrogen-mercapturate adducts in animals, comprising:
obtaining a sample of body fluids; and
assaying for the presence of a monoclonal antibody,
wherein the monoclonal antibody specifically binds the adducts.

13.

A diagnostic method according to claim 12 wherein the body fluid is selected from the group consisting of a blood sample and a urine sample.

14.

A diagnostic method according to claim 12 wherein the assaying step detects the monoclonal antibody using a method selected from the group consisting of spectrophotometrically, colorimetrically, and fluorometrically.

15.

A diagnostic method according to claim 12 wherein the adduct in the body fluid sample is captured with the monoclonal antibody and the immunodiagnostic reagent in a volume ratio of from about 1:1 to 1:300.

16.

An immunocapture test capable of detecting adducts selected from the group consisting of estrogen-guanine and estrogen-mercapturate adducts comprising:

a monoclonal antibody which captures a specific antigenic portion of an adduct selected from the group consisting of an estrogen-guanine or an estrogen-mercapturate adduct;

a labeled monoclonal antibody which detects the presence of the captured antigenic portion of the adduct;

a body fluid sample suspected of containing an adduct.

17.

An immunocapture test according to claim 16 wherein the body fluid is selected from the group consisting of a blood sample or a urine sample.

18.

A method for detecting estrogen-induced cancer in humans comprising:

obtaining a body fluid sample suspected of containing adducts selected from the group consisting of estrogen-guanine and estrogen-mercapturate adducts from a human; and

assaying for the presence of the adducts in said sample with a monoclonal antibody which specifically binds the adducts.

19.

A method according to claim 18 wherein the adduct is selected from the group consisting of 7[4-hydroxyestron-1(α,β)-yl]guanine, 7[4-hydroxyestradiol-1(α,β)-yl]guanine, 4-hydroxyestron-2-yl-cysteine, 4-hydroxyestradiol-2-yl-cysteine, 4-hydroxyestron-2-yl-N-acetylcysteine, 4-hydroxyestradiol-1-yl-N-acetylcysteine, 2-hydroxyestron-1-yl-cysteine, 2-hydroxyestradiol-1-yl-cysteine, 2-hydroxyestron-1-yl-N-acetylcysteine, 2-hydroxyestradiol-1-yl-N-acetylcysteine, 2-hydroxyestron-4-yl-cysteine, 2-hydroxyestradiol-4-yl-cysteine, 2-hydroxyestron-4-yl-N-acetylcysteine, and 2-hydroxyestradiol-4-yl-N-acetylcysteine.

20.

A synthetic antigen having the general formula:

$$[R_1\text{-}C\text{-}L\text{-}]_n\text{-Carrier}$$

wherein R_1-C is a hapten comprising an adduct selected from the group consisting of estrogen-guanine and estrogen-mercapturate and the estrogen

is selected from the group consisting of estrone and estradiol;

-L- is coupled to R_1 at C-16 of the estrogen, and L represents a linking moiety which includes the residue of the reaction of a first linking agent reactive group with the C-16 group of R and is attached to the carrier by a connective group which is the residue of a second linking-agent reactive group with a reactive coupling group on the carrier;

the carrier is a macromolecule conferring antigenicity; and

n is an integer not exceeding the number of available reactive coupling groups on the carrier.

21.

A synthetic antigen according to claim 20 wherein L is a divalent residue derived from a compound selected from the group consisting of succinimidyl-4-(N-maleimidomethyl)cyclohexane-1-carboxylate, sulfosuccinimidyl-4-(N-maleimidomethyl)cyclohexane-1-carboxylate, N-τ-maleimidobutyryloxysuccinimide ester, N-τ-maleimidobutyryloxysulfosuccinimide ester and N-succiniuridyl-3(2-pyridyldithio)propionate.

22.

A synthetic antigen according to claim 21 wherein L is N-maleimidomethylcyclohexane-1-carboxylate.

23.

A synthetic antigen according to claim 20 wherein the carrier is a protein selected from the group consisting of mammalian serum albumins, keyhole limpet hemocyanin, mammalian immunogammaglobulins, thyroglobulin, ovalbumin and poly-1-lysine.

24.

A monoclonal antibody which is specific to the antigen of claim 20.

25.

A polyclonal antibody which is specific to the antigen of claim 20.

26.

A monoclonal antibody according to claim 24 wherein the monoclonal is insolubilized by securing it to a solid matrix.

27.

A method for detecting the hapten of claim 20 in a biological sample comprising:

exposing the biological sample or an extract thereof suspected of containing the hapten, to an antibody which recognizes the hapten; and

detecting the presence of immunocomplexes formed between said antibody and said hapten.

28.

A method according to claim 27 wherein the antibody is a monoclonal antibody.

29.

A method of detecting estrogen-mercapturate adducts and estrogen-purine base adducts in a biological fluid sample comprising:

reacting the fluid sample with a fluorescent probe such that the fluorescent probe couples to the estrogen-mercapturate adducts and estrogen-purine base adducts in the fluid sample to form fluorescent adducts;

detecting the fluorescent adducts using high pressure liquid chromatography.